

## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>SALK2370W0</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/US 00/ 20674</b>	International filing date (day/month/year) <b>27/07/2000</b>	(Earliest) Priority Date (day/month/year) <b>27/07/1999</b>
Applicant  <b>THE SALK INSTITUTE FOR BIOLOGICAL STUDIES</b>		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 6 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

## 1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☒ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.

3



None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No

/US 00/20674

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/29 C12N15/54 C12N9/10 C12Q1/48

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C12N C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, EMBL, BIOSIS, MEDLINE, EMBASE

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JEZ J M ET AL.: "Structure of chalcone synthase and the molecular basis of plant polyketide biosynthesis." FASEB JOURNAL. MEETING INFO.: ANNUAL MEETING OF THE AMERICAN SOCIETIES FOR EXPERIMENTAL BIOLOGY ON BIOCHEMISTRY AND MOLECULAR BIOLOGY 99 SAN FRANCISCO, CALIFORNIA, USA MAY 16-20, 1999, vol. 13, no. 7, 23 April 1999 (1999-04-23), page A1392 XP002158823	1,6,7, 12-14, 16,17, 22-39
Y	abstract 355  --- -/--	13,15, 18,22, 25, 29-31, 34-36

☒ Further documents are listed in the continuation of box C.☐ Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

31 January 2001

Date of mailing of the international search report

19/02/2001

Name and mailing address of the ISA

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## INTERNATIONAL SEARCH REPORT

International Application No

US 00/20674

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE PDB 'Online! ID 1BI5, 22 June 1999 (1999-06-22) FERRER J-L ET AL.: "Chalcone synthase from Alfalfa" XP002158822 cited in the application	1,6,7, 12-14, 16,17, 22-39
Y	the whole document	13,15, 18,22, 25, 29-31, 34-36
X	--- JUNGHANS H ET AL.: "Stress responses in alfalfa (Medicago sativa L.). 15. Characterization and expression patterns of members of a subset of the chalcone synthase multigene family" PLANT. MOL. BIOL., vol. 22, no. 2, May 1993 (1993-05), pages 239-253, XP002158812 cited in the application Note: 99.7% aa sequence identity of CHS2 with SEQ ID NO:1 in in 389 aa overlap. abstract figures 1-3	1,7
Y	--- RAIBER S ET AL.: "Molecular and enzymatic characterization of two stilbene synthases from Eastern white pine (Pinus strobus). A single Arg/His difference determines the activity and the pH dependence of the enzymes." FEBS LETT., vol. 361, no. 2-3, 20 March 1995 (1995-03-20), pages 299-302, XP002158813 abstract figure 2	13,22, 29,31, 34,36
Y	--- HELARIUTTA Y ET AL.: "Chalcone synthase-like genes active during corolla development are differentially expressed and encode enzymes with different catalytic properties in Gerbera hybrida (Asteraceae)" PLANT MOLECULAR BIOLOGY, vol. 28, no. 1, April 1995 (1995-04), pages 47-60, XP002158814 abstract figure 1	13,15, 22,29, 31,34,36
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## INTERNATIONAL SEARCH REPORT

International Application No

US 00/20674

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	ECKERMAN S ET AL.: "New pathway to polyketides in plants" NATURE, vol. 396, 26 November 1998 (1998-11-26), pages 387-390, XP002158815 cited in the application abstract page 389, left-hand column, line 50-53 ---	13,15, 22,29, 31,34,36
X	TROPF S ET AL.: "Reaction mechanisms of homodimeric plant polyketide synthases (stilbene and chalcone synthase) - a single active site for the condensing reaction is sufficient for synthesis of stilbenes, chalcones, and 6'-deoxychalcones" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 270, no. 14, 7 April 1995 (1995-04-07), pages 7922-7928, XP002158816 abstract  figures 2,3; tables I,II ---	1,2,7,8, 12
Y	PREISIG-MÜLLER R ET AL.: "Plant polyketide synthases leading to stilbenoids have a domain catalyzing malonyl-CoA:CO <sub>2</sub> exchange, malonyl-CoA decarboxylation, and covalent enzyme modification and a site for chain lengthening" BIOCHEMISTRY, vol. 36, no. 27, 8 July 1997 (1997-07-08), pages 8349-8358, XP002158817 abstract  tables 1,4 ---	18,25, 30,31, 35,36
X	HUANG W ET AL.: "Crystal structure of beta-ketoacyl-acyl carrier protein synthase II from E. coli reveals the molecular architecture of condensing enzymes" THE EMBO JOURNAL, vol. 17, no. 5, 2 March 1998 (1998-03-02), pages 1183-1191, XP002158818 abstract page 1183, left-hand column, line 1 -right-hand column, line 2 page 1189, right-hand column, line 1-19 --- -/--	12,16, 28,30, 33,35,38

## INTERNATIONAL SEARCH REPORT

International Application No

US 00/20674

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SCHRÖDER J: "A family of plant-specific polyketide synthases" TRENDS IN PLANT SCIENCE, vol. 2, 1997, pages 373-378, XP000979251 the whole document page 376, right-hand column, line 36,37 ---	1,7
A	SCHRÖDER J ET AL: "Stilbene and chalcone synthases: related enzymes with key functions in plant-specific pathways" ZEITSCHRIFT FUER NATURFORSCHUNG. SECTION C. BIOSCIENCES, vol. 45c, no. 1-2, 1990, pages 1-8, XP000564724 the whole document ---	1,7
P,X	FERRER J-L ET AL.: "Structure of chalcone synthase and the molecular basis of plant polyketide biosynthesis" NATURE STRUCTURAL BIOLOGY, vol. 6, no. 8, August 1999 (1999-08), pages 775-784, XP000979629 the whole document ---	1,2,6-8, 12-18, 22-39
P,X	JEZ J M ET AL.: "Dissection of malonyl-coenzyme A decarboxylation from polyketide formation in the reaction mechanism of a plant polyketide synthase" BIOCHEMISTRY, vol. 39, no. 5, 8 February 2000 (2000-02-08), pages 890-902, XP002158820 the whole document ---	1-14, 17-20, 22-39
T	HE M ET AL.: "Structural modeling and site-directed mutagenesis of the actinorhodin beta-ketoacyl-acyl carrier protein synthase" JOURNAL OF BACTERIOLOGY, vol. 182, no. 9, May 2000 (2000-05), pages 2619-2623, XP002158821 abstract -----	12,16, 28,30, 33,35,38